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EXAMINER

SANDERSON, JOSEPH W

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Newly submitted claim 34 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The new claim is related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product the product as claimed can be made by another and materially different process such as without molding. (The product as claimed is an intermediate product, while the method is for making a completed product.)

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 34 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 17, 21-23 and 26-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The language of claim 17 renders the scope of the claim unclear as it is excessively verbose and convoluted. The claim should be re-written in a more concise form, with each new component beginning on a new line and indented (see 37 CFR 1.75(i)).

Claim 17 recites the skin comprised of “materials designed to resist shear.” It is unclear whether these materials are the same as the various layers recited later or additional unknown materials.

Claim 17 cites a molding product-by-process limitation that renders the scope of the claim unclear, as it appears to require both an unfinished (intermediate) structure as well as the finished structure in the same claim.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 17, 21-23, 26-28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Westre et al. (US 6 114 050) in view of Suyama et al. (US 6 217 997) and Newell (US 5 407 727).

Regarding claims 17, 22 and 23:

Westre discloses an aircraft exterior skin comprising:

a composite material and a metallic material (as seen in Figs 1 and 4A; abstract), the composite material comprising carbon fibers embedded in a ceramic (as depicted), the metallic material being aluminum, titanium or alloys of each (col 5, lines 1-2), a resin coating the materials (the resin binding the fibers and/or adhering the foil), the skin having a sandwich design (as depicted), the layers being adhesively bonded.

Westre does not disclose the carbon fibers coated in a nitride or carbide bond and in a metal.

Suyama teaches an aircraft structural component (as noted in the technical field section) wherein carbon fibers are coated in a silicon carbide mixture and ceramic fibers are embedded in a ceramic matrix, as well as silicate fiber materials (abstract; col 4, lines 36-47 indicates a list of fibers for use, rendering multiple types used together by stating that *at least one* of type may be used, with one form being SiC-coated fibers with a carbon core, thus rendering carbide-coated carbon fibers, and also including silicon carbide and silicon nitride fibers; the claims do not require a separate layer for the silicate fiber material, only that it is present in the hybrid material) to gain fracture toughness.

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Further, Newell teaches fibers embedded in a metal as an alternative to embedding in ceramic (claim 1), the metal specifically being titanium (col 3, lines 33-38).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Westre to use carbon fibers coated in a silicon carbide mixture and ceramic fibers embedded in metal as taught by Suyama and Newell to gain fracture toughness of the composite, to reduce electrical conductivity (carbon fibers being known electrical conductors), and as metallic and ceramic materials for embedding are art-recognized functionally equivalent means for providing an aircraft reinforced composite material.

Regarding claims 21 and 26:

The discussion above regarding claim 17 is relied upon.

The limitations of claims 21 and 26 further limit the embodiments with carbon and glass fibers, with the carbon fibers embedded in ceramic. However, Westre as modified renders the embodiment of carbon fibers with ceramic fibers embedded in metal, rendering these limitations optional.

Regarding claims 27, 28 and 30:

The discussion above regarding claim 17 is relied upon.

Westre discloses the outer surface of the exterior skin exposed to weathering protected by joined a plate-like planking (28) to the outer surface comprised of a combination material of a non-metallic and metal (seen in Fig 3B), the planking being protective against burn through (due

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to the structure), adjusted to an outer contour of the exterior skin (to fit on the fuselage), and comprising aluminum or aluminum alloy (col 5, lines 1-2).

6. Claims 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Westre et al. ('050) in view of Suyama et al. ('997) Newell ('727) as applied to claim 17 above, and further in view of Palm (US 6 861 156).

Regarding claim 29:

The discussion above regarding claim 28 is relied upon.

Westre discloses an aircraft planking using a combination material, but does not specifically disclose the material as a GLARE material.

Palm discloses as known in the art an aircraft using a GLARE material as a known weight saving material with high damage tolerance (col 1, lines 43-46).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Westre to use GLARE as taught by Palm for the well-known predictable advantage of decreasing the weight of the aircraft while increasing the damage tolerance.

Regarding claims 31 and 32:

The discussion above regarding claims 17 and 23 is relied upon.

Westre discloses carbon fiber composites, but does not disclose use of glass fiber composites.

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Palm teaches glass fiber composites (specifically GLARE, as noted above).

It would have been an obvious matter of design choice to use glass fiber composites as well, since applicant has not disclosed that the additional use solves any stated problem or is for any particular purpose and it appears that the invention would perform equally as well with carbon fiber composites alone (as also noted by the alternative use within the disclosure).

7. Claims 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Westre et al. ('050) in view of Suyama et al. ('997) Newell ('727) as applied to claim 17 above, and further in view of Heitkamp (US 5 460 864).

Westre as modified renders a layered metal/composite fuselage structure, with fibers embedded throughout, but does not render the exterior skin comprising silicate fiber material.

Heitkamp teaches an aircraft layered structure comprising a silicate fiber (glass, asbestos, etc.; col 3, lines 5-14) to serve as a fire barrier (col 3, lines 22-26).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have further modified Westre to use silicate fibers in the exterior skin as taught by Heitkamp to resist external fires or aerodynamic heating from damaging the interior.



***Response to Arguments***

8. Applicant's arguments filed 28 September 2011 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually (variously repeated throughout the remarks), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that, Suyama teaches. One of ordinary skill would look to Suyama for known fiber materials.

In response to applicant's argument that Suyama teaches against parallel fibers and uses a ceramic matrix rather than resin, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Suyama teaches known materials for forming embedded fibers in aerospace applications, which may be used for the fiber materials in the hybrid construction of Westre.

In response to applicant's argument that the fibers of Newell teaches away from the claimed fire resistance, and that Heitkamp teaches an "entirely different structure," Newell is used for the teaching of embedding fibers in a metallic material in aerospace systems, and Heitkamp teaches glass fibers for fire resistance in aerospace applications. Once again, the test

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for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, but what the combined teachings of the references would have suggested to those of ordinary skill in the art.

Applicant states that they traverse the Official Notice (page 9). No such notice is taken in the action.

However, the traversal is against the statement that ceramic and metallic materials are “art-recognized functional equivalents.” Newell discloses in claim 1 that fibers may be embedded in a “composite metal or ceramic matrix material.” This *explicitly* indicates that either material may be used for the same purpose, rendering functional equivalence as known by the reference (i.e. “art-recognized”). The functionally equivalent material means for embedding the fibers is then applied to the fibers of Westre, which has both ceramic and metal layers.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph W. Sanderson whose telephone number is (571)272-6337. The examiner can normally be reached on M 6:30 am - 11:30 am, T-F 6:30 am - 300 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy D. Collins can be reached on (571)272-6886. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. W. S./

Examiner, Art Unit 3644

/JOSHUA J MICHENER/

Primary Examiner, Art Unit 3644